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## A Review of the Genus *Podolasia* Harold (Coleoptera: Scarabaeidae)

BY HENRY F. HOWDEN<sup>1</sup>

The first representative of the genus *Podolasia* was described by LeConte (1856, p. 283) as *Lasiopus ferruginea*. In 1869 Harold (p. 122) noted that the name *Lasiopus* was preoccupied in the Curculionidae by *Lasiopus* Schonherr, and therefore he renamed the genus *Podolasia*. Originally, this genus was included in the tribe Chasmatopterini in the Melolonthinae. In 1937, when Saylor elevated the Chasmatopterini to subfamily rank, he removed the genus *Podolasia* from the subfamily stating: "Although the mouthparts and connate abdominal segments appear to place this genus with the Chasmatopterinae the general habitus and the remaining morphological features are radically different and prevent its inclusion in this subfamily. Until specimens can be dissected, the exact place of the genus in the scheme of classification must remain in doubt. It is quite probable, however, that *Acoma* will be its nearest relative" (1937, p. 532).

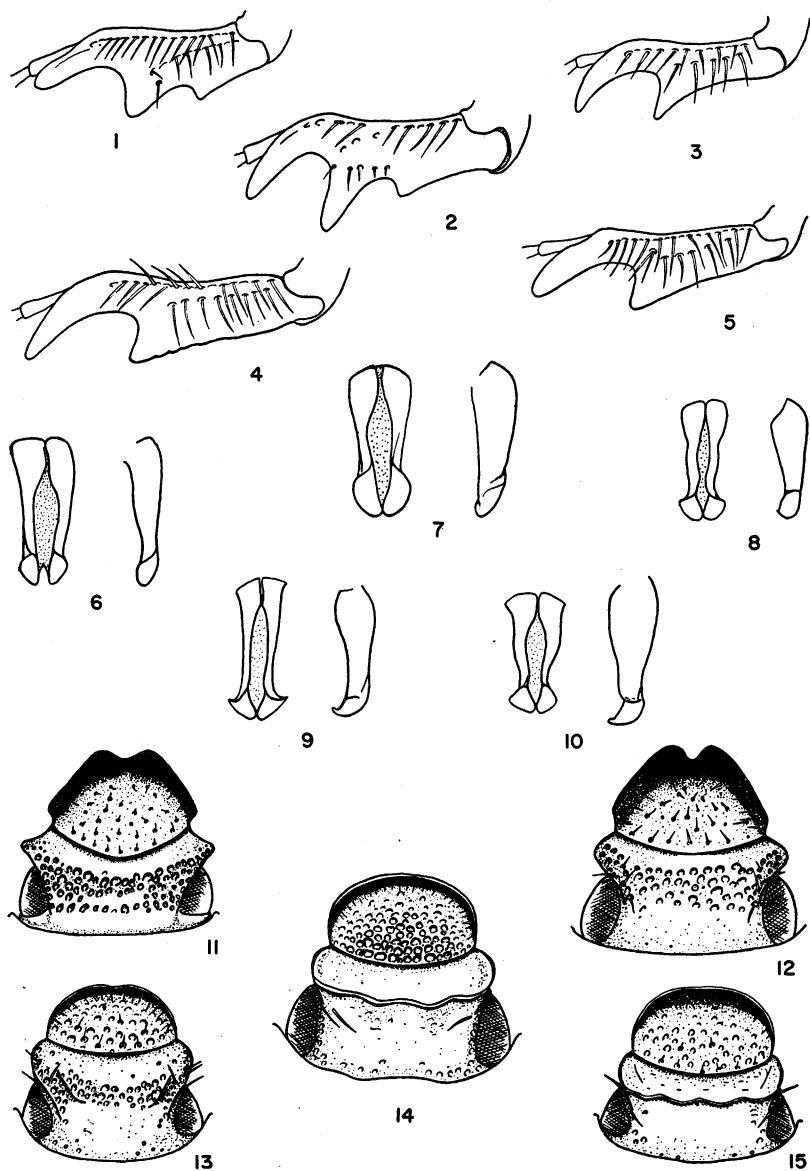
When 11 years later Saylor (1948, p. 340) had an opportunity to examine about 90 specimens of this genus from Lower California, he merely repeated his earlier statements.

The present writer is inclined to agree with Saylor that the nearest relative of *Podolasia* seems to be *Acoma*, but feels that definite placement of the group should be postponed until the females of both genera become known.

The complete absence of females of both genera in the collections studied is interpreted to indicate that they are flightless. This supposition of the flightless condition of the females also appears to be substantiated by

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<sup>1</sup> Department of Zoology and Entomology, University of Tennessee. Contribution from the Entomology Department, North Carolina Agricultural Experiment Station, Raleigh, North Carolina; published with the approval of the Director of Research as Paper No. 473 of the Journal Series.



FIGS. 1-5. Left fore tibiae. 1. *Podolasia ferruginea*. 2. *P. emarginata*. 3. *P. pilosa*. 4. *P. varicolor*. 5. *P. peninsularis*.

FIGS. 6-10. Male genitalia (left, front view; right, lateral view). 6. *Podolasia ferruginea*. 7. *P. emarginata*. 8. *P. pilosa*. 9. *P. varicolor*. 10. *P. peninsularis*.

FIGS. 11-15. Front of heads. 11. *Podolasia ferruginea*. 12. *P. emarginata*. 13. *P. pilosa*. 14. *P. varicolor*. 15. *P. peninsularis*.

the geographic variation noted between different populations, for, while each population exhibits moderate uniformity, considerable differences exist between different populations of related forms. Other factors may be involved in establishing these variations, but at present seem unlikely.

LeConte's original description (1856, pp. 282-283) of the genus reads as follows: "Body oval, elongate convex, fringed at the sides and beneath, and on the legs with very long hairs. Head small, eyes large, hardly emarginate at tip, separated from the head by a deep transverse concave line. Mouth small, labrum and mandibles invisible; mentum small, narrow, not larger than the base of the maxillae. Palpi slender. Antennae 9-jointed; first and second joints thick, hairy; four following small; club three jointed, small. Thorax rounded on the sides, convex, narrower in front. Elytra elongate, convex, partly covering the pygidium. Legs strong, hairy; anterior tibiae subtridentate; middle tibiae conical, with a crown of spines externally at the middle, and two terminal spurs; posterior thighs very large, posterior tibiae like the middle ones, but much thicker. Tarsi twice as long as the tibiae, slender, with verticillate hairs at the articulations; last joint with two long terminal hairs above; ungues long, slender, diverging onychium hardly visible, bisetose."

A few necessary changes and additions should be made to this description as follows: Size small, 3.5 to 7 mm.; clypeus rounded, sometimes concave and emarginate (see figs. 11 to 15); antenna eight- or nine-segmented; elytra usually bearing a few scattered long hairs; anterior tibia tridentate or bidentate; tarsi longer than tibiae, but not necessarily twice as long; the coxae and trochanters of the hind legs large, similar to those of *Acoma*. Also, the shape of the apices of the parameres of the male genitalia with their enlarged triangular tips (see figs. 6 to 10) seem typical for the genus.

The writer wishes to extend his thanks to the following individuals who aided him greatly by furnishing specimens and information: Mr. Hugh B. Leech, California Academy of Sciences; Dr. P. J. Darlington, Jr., Museum of Comparative Zoölogy; Dr. Milton W. Sanderson, Illinois Natural History Survey; Dr. Mont A. Cazier, the American Museum of Natural History, Drs. R. E. Blackwelder and O. L. Cartwright, United States National Museum, and Dr. R. H. Beamer and Mr. Paul J. Spangler, University of Kansas.

KEY TO THE MALES OF THE SPECIES OF *Podolasia* HAROLD

- 1. Fore tibia tridentate . . . . . 2
- Fore tibia bidentate . . . . . 3
- 2. Clypeus with scattered short hairs on disc, moderately or poorly emarginate anteriorly (fig. 11); gena just before eye produced laterally with outer angle abruptly rounded. Texas . . . . . *ferruginea* LeConte

- Clypeus with numerous rather long hairs on disc, sharply emarginate anteriorly (fig. 12); gena just before eye produced laterally and gradually rounded (fig. 12). Utah . . . . . *emarginata*, new species
3. Vertex of head with a pronounced transverse carina behind the sharp declivity at the base of the clypeus (figs. 14, 15); antenna eight-segmented. Lower California . . . . . 4
- Vertex of head without transverse carina behind the sharp declivity at the base of the clypeus (fig. 13); antenna nine-segmented. El Paso, Texas; White Sands, New Mexico, to Alhumada, Mexico . . . *pilosa*, new species
4. At least vertex of head, thorax, and scutellum completely black; clypeus heavily punctate, with the margin abruptly reflexed, concave both anteriorly and laterally (fig. 14). Region of La Paz . . . . . *varicolor* Saylor
- Vertex of head, thorax, and scutellum usually testaceous to brownish black (over-all color usually uniform); clypeus slightly to moderately punctate, with the margin abruptly reflexed, concave only anteriorly (fig. 15) . . . 5
5. Vertex of head behind transverse carina slightly concave in lateral view; size 4 mm. or over. Vicinity of Venancio . . . *peninsularis*, new species
- Vertex of head behind transverse carina slightly convex in lateral view; size less than 4.0 mm. Vicinity of San Domingo . . . *saylori*, new species

*Podolasia ferruginea* (LeConte)

Text figures 1, 6, 11

*Lasioptus ferruginea* LECONTE, 1856, Jour. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 3, p. 283.

*Podolasia ferruginea* (LeConte), HAROLD, 1869, Coleopterologische Hefte, no. 5, p. 122. SAYLOR, 1948, Proc. California Acad. Sci., vol. 24, p. 340.

MALES: Total length, 5 to 5.5 mm.; greatest width, 1.5 to 2 mm. Color uniform shining reddish brown, sometimes with the head and thorax a dark brown. Ventral surface and legs reddish brown to brown. Anteriorly and laterally clypeus is reflexed upward; anteriorly clypeal margin is shallowly emarginate (fig. 11) with the posterior angles of the elevated margin sharp, only slightly obtuse. Disc of clypeus with scattered punctures, often bearing fine setae. Posterior edge of the clypeus elevated above the frons and sharply delimited. Gena produced laterally in front of eye, often rather spike-like (fig. 11). Vertex of the head between eyes heavily, irregularly punctate (fig. 11), no transverse carina present. Vertex forms a definite ridge at the inner edge of each eye, lacking setae. Pronotum completely margined and edged with numerous long hairs. Definite transverse punctate groove present behind anterior margin. Anterior pronotal angles only very slightly obtuse, posterior pronotal angles indistinct. Pronotum widest medially, slightly more narrowed anteriorly than posteriorly. Pronotum with moderate number of coarse punctures scattered unevenly over its surface, with an occasional puncture bearing a

long seta. Elytra with only sutural striae evident. Uneven rows of coarse punctures present, some with short setae, which are more numerous laterally. Pygidium finely alutaceous, with long setae; shape elongately triangular with the tip evenly rounded. Ventral surfaces of head, thorax, and abdomen with numerous long setae. Mouth parts except for palpi vestigial and not evident. Antenna nine-segmented, the first two segments large, the succeeding four small, about one-third of the diameter of the first two, the last three segments forming the antennal club which is scarcely longer than the last segment of the maxillary palpi. Last segment often concave (owing probably to drying). Fore tibia strongly tridentate (fig. 1). Mesothoracic tibia with a median short oblique outer spinose carina. Metathoracic tibia elongately triangular in outline with an oblique spinose carina on its outer apical third extending about halfway across it. Mesothoracic and metathoracic femora with a postmedian longitudinal row of setose punctures, metathoracic femora greatly enlarged, about three-fifths as wide as long. Tarsi all longer than the tibiae; all claws simple. Coxae large, similar to those of *Acoma*. Abdomen slightly connate with all except the last segment fused; sutures evident, with numerous long setae along the lines of juncture.

Genitalia almost symmetrical, with the tips of the parameres expanded into a thickened triangular structure, rounded laterally and blunt at the tip (fig. 6). Some variation is present in the shape of the outer angles.

FEMALE: Unknown.

TYPE MATERIAL: Male, Ringgold Barracks, Texas (LeConte Collection in the Museum of Comparative Zoölogy at Harvard College).

The above description was based largely on a specimen from Fort Ringgold, Texas, compared with LeConte's type by P. J. Darlington, Jr. The type measures 5.4 mm. in length and 2.3 mm. in greatest width.

Only a few specimens of this species were seen by the writer, and variation was mainly evident in the degree of emargination and concavity of the clypeus, and in the gena, which was rounded instead of pointed in the Laredo specimens. One specimen from Falfurrias, Texas, in the collection of the American Museum of Natural History, differed considerably from other specimens by having the fore tibia only very feebly tridentate and the clypeus only slightly concave. Additional material may indicate the variability of the clypeus to be sufficient to warrant recognition of additional species, but so few specimens were examined in this group that the limits of specific variation were not clear.

This species as described here can be easily distinguished by its tridentate fore tibiae, shallowly emarginate clypeus with short fine hairs in the scattered clypeal punctures, and the genitalic characters.

Specimens were seen from the following localities in Texas: Fort Ringgold, Laredo, and Falfurrias.

*Podolasia emarginata*, new species

Text figures 2, 7, 12

HOLOTYPE: Male, length, 5.4 mm.; greatest width, 2.2 mm. Color uniform reddish brown dorsally and ventrally. Anteriorly and laterally clypeus is sharply reflexed upward, anteriorly margin is deeply emarginate (fig. 12), with the posterior angles of the elevated margin sharp, moderately obtuse. Disc of clypeus with scattered punctures, usually bearing setae which are higher than the reflexed clypeal margin. Posterior edge of the clypeus elevated above the frons and sharply delimited. Gena produced laterally in front of the eye and evenly arcuate. Vertex of the head between the eyes heavily, irregularly punctate (fig. 12); no transverse carina present. Vertex forms a definite ridge over the anterior inner edge of each eye, with several long setae present over the eyes. Pronotum completely margined, poorly so laterally; edged with long hairs. Punctate transverse groove present behind anterior margin. Coarse punctures rather evenly scattered over pronotum except at dorsal midline where they are lacking. Anterior pronotal angles produced forward by eyes and slightly arcuate. Posterior angles indistinct. Pronotum widest medially, slightly more narrowed anteriorly than posteriorly. Elytra with only sutural stria vaguely indicated. Uneven rows of coarse punctures present on elytra, some with short setae, which are more numerous laterally. Pygidium alutaceous, with some long setae; shape elongately triangular, with the tip evenly rounded. Ventral surface similar to that described for *ferruginea*. Antennal clubs and most of the tarsi broken off. The fore tibia (fig. 2) is strongly tridentate. Legs and abdomen similar to those of *ferruginea*.

Genitalia almost symmetrical, with the tips of the parameres greatly expanded, more so than in any other species (fig. 7).

Female unknown.

TYPE MATERIAL: Holotype, male, near Hanksville, Utah, base of Henry Mountains, June 1936, E. Bowles (U.S.N.M. No. 61684).

Only a single specimen of this species was seen. It can be easily distinguished by its tridentate fore tibia, sharply emarginate clypeus, and the very characteristic male genitalia.

*Podolasia pilosa*, new species

Text figures 3, 8, 13

HOLOTYPE: Male, length, 4.5 mm.; greatest width, 2.1 mm. Color uniform shining reddish brown dorsally and ventrally. Clypeus evenly arcuate.

ate, anteriorly abruptly but not greatly reflexed upward. Disc of clypeus heavily, coarsely punctured posteriorly, setae numerous; posterior edge elevated above the frons and sharply delimited (fig. 13). Gena produced laterally in front of eye and evenly arcuate. Anterior of vertex between the eyes heavily, coarsely, irregularly punctate, no transverse carina present; posterior portion of vertex smooth; laterally vertex forms a definite ridge over the anterior inner edge of each eye, with several long setae present along the inner edge of the ridge (fig. 13). Pronotum completely margined, poorly so laterally; edged with long hairs. Transverse punctate groove behind anterior pronotal margin only vaguely indicated, only a few coarse punctures unevenly scattered over disc. Anterior angles produced forward by eyes and slightly acute; posterior angles indistinct. Pronotum widest medially, slightly more narrowed anteriorly than posteriorly. Elytra with only sutural stria indicated by a vague indentation and a row of large punctures. Uneven rows of coarse punctures present over elytra, many bearing long setae, which are more numerous laterally. Pygidium finely alutaceous, with numerous long setae; shape triangular, with tip broadly rounded. Ventral surface of head, thorax, and abdomen with scattered long setae. Mouth parts except for palpi vestigial and not evident. Antenna nine-segmented, the first two segments large, the succeeding two small, about one-third of the diameter of the first two, the fifth and sixth segments greatly shortened and disc-like, and the last three segments forming the club, the outer segment concave (probably due to drying), shining and hardly longer than the last segment of the maxillary palpi. Fore tibia bidentate (fig. 3); in other respects the legs are generally similar to those of *ferruginea*, though the tarsi are proportionately shorter than they are in *ferruginea*. Abdomen shining, with only last segment not fused; a few long setae are present along the lines of fusion.

Genitalia almost symmetrical with the tips of the parameres thickened into a triangular structure (fig. 8), rounded laterally and with tips recurved in lateral view.

Female unknown.

TYPE MATERIAL: Holotype, male, Samalayuca, Chihuahua, Mexico, June 24, 1947, David Rockefeller expedition, Cazier (the American Museum of Natural History). Paratypes, 56 males with same data as type; two males, Ahumada, Mexico, July 22, 1952, at light, R. B. and J. M. Selander; one male, Presidio, Texas, May 1, 1930, W. L. Owen, Jr.; one male, Davis Mountains, Texas, June 26, 1946, Van Dyke collection; one male, White Sands, New Mexico, June 17, 1947, Stroud (RC-4); two males, White Sands, New Mexico, June 30, 1932, R. H. Beamer; nine males, Las Cruces, New Mexico, June 8, 1933, R. H. Beamer and J. D.

Beamer; 12 males, Las Cruces, New Mexico, June 17, 1950, L. D. Beamer. Paratypes in the collections of the American Museum of Natural History, California Academy of Sciences, United States National Museum, Illinois Natural History Survey, University of Kansas, and the collection of the writer.

Variation in this species is moderate, the size ranging in length from 3.6 mm. to 5.1 mm. and in width from 1.5 mm. to 2.2 mm. Variation, other than in size, is evident in color which ranges from light reddish tan to dark brown, amount of concavity of the clypeus, which is also sometimes slightly emarginate, and shape and length of the oblique carina of the hind tibia. This carina may be straight or curved and extend from one-third to two-thirds of the distance across the tibia. The Ahumada, Mexico, specimens are uniform dark brown, with the punctures of the dorsal surface slightly more pronounced than in the holotype, but otherwise similar.

This species can be easily distinguished by the bidentate fore tibia, the absence of a transverse carina on the vertex of the head between the eyes, and the rows of long setae on the elytra. The characteristically nine-segmented antenna with the fifth and sixth segments reduced in length is interesting as it seems to be intermediate between the eight-segmented antennae of the Lower California species and the nine-segmented ones of the others.

*Podolasia varicolor* Saylor

Text figures 4, 9, 14

*Podolasia varicolor* SAYLOR, 1948, Proc. California Acad. Sci., vol. 24, p. 339.

At the request of the writer, Mr. Hugh B. Leech kindly measured the holotype, giving the following measurements: length, 6.8 mm.; greatest width, 2.8 mm.

Two species have been found represented in the type series of *varicolor*. When examined by the present writer, only the specimens from the type locality appeared to represent the species *varicolor* as described by Saylor.

This species can be distinguished by the following: size, 6 to 7 mm. in length; color of the vertex of the head, thorax, scutellum, and elytral apices entirely black; ventral surface dark brown to black, with the tarsi reddish brown; flat disc of clypeus very coarsely and contiguously punctate, the lateral and anterior margin abruptly reflexed (fig. 14), vertex behind the transverse carina concave in lateral view with a few scattered punctures; antenna apparently eight-segmented (instead of nine as stated by Saylor); at least central part of antennal club light reddish brown in color; pygidium finely alutaceous and with many long setae, triangular in



shape with tip slightly truncate; front tibia bidentate (fig. 4); outer surface of hind tibia above the oblique carina with large punctures bearing long setae; triangular thickened area at the tip of the male genitalia with its outer angles sharp, often pointed (fig. 9).

Variation in the few specimens seen was slight. The "female" allotype of *varicolor* and the other largely brown paratypes from Venancio and San Ignacio, Lower California, have all proved to be males of a different species.

TYPE MATERIAL: Male, 15 miles west of La Paz, Lower California, July 5, 1938, collected at light, Michelbacher and Ross collectors (California Academy of Sciences).

*Podolasia peninsularis*, new species

Text figures 5, 10, 15

HOLOTYPE: Male, length, 4.4 mm.; greatest width, 1.9 mm. Color uniform shining reddish brown, except tips of elytra and entire abdomen dark brown. Clypeus moderately, coarsely punctate, punctures usually separated by almost their own diameter and unevenly placed, occasionally bearing a very fine seta. Clypeus flat, sharply reflexed upward anteriorly, only very slightly so laterally (fig. 15). Posterior edge of clypeus delimited by a sharp declivity. Across the front of the vertex, just before the eyes, is a sharp, slightly sinuous, transverse carina almost parallel to the posterior clypeal margin. Laterally, the carina extends onto the gena and is gradually rounded forward to meet the posterior angles of the clypeus (fig. 15). Vertex almost impunctate and shining, slightly concave behind the transverse carina when viewed laterally. Vertex behind transverse carina does not form a ridge above the eyes. Pronotum completely margined, rather poorly so laterally, and fringed with long setae. Pronotum with scattered coarse punctures more numerous laterally and occasionally bearing long setae. Elytra with only sutural stria evident; uneven rows of coarse punctures present, a few bearing very short setae which are more numerous laterally. Pygidium shining, with numerous long setae scattered over its surface; elongately triangular, with tip slightly reflexed outward and broadly rounded. Ventral surfaces of head, thorax, and abdomen with numerous long setae. Mouth parts vestigial and not evident. Antenna eight-segmented, the first two segments large, the succeeding three small, about one-third of the diameter of the first two, the last three segments forming the antennal club, which is scarcely longer than the last segment of the maxillary palpi. Last segment concave (probably collapsed because of drying). Fore tibia strongly bidentate (fig. 5). Mesothoracic tibia with a median short outer spinose carina. Metathoracic tibia

elongately triangular in outline, with an oblique spinose carina on its outer apical third extending entirely across it. The outer portion of the hind tibia above this carina with only four deep punctures and six or seven long setae. Mesothoracic and metathoracic femora with a post-median longitudinal row of setose punctures, metathoracic femora greatly enlarged, about five-sevenths as wide as long. Tarsi all longer than the tibiae; all claws simple. Coxae large, similar to those of *Acoma*. Abdomen connate, with all but the last segment fused, sutures vague but paralleled by rows of long setae.

Genitalia symmetrical, with the tips expanded into thickened triangular structures which are sharply rounded laterally and curved downward at their tips (fig. 10).

Female unknown.

TYPE MATERIAL: Holotype, male, Venancio, Lower California, July 17, 1938, collected at light, Michelbacher and Ross collectors (California Academy of Sciences). Paratypes, 71 males, all with same data as type. (These specimens are paratypes of *varicolor*.)

Paratypes in the collections of the California Academy of Sciences, the American Museum of Natural History, United States National Museum, and the collection of the writer.

Variation in the specimens of the type series is not great. Size ranges from 4 to 6 mm. in length. Color varies from a uniform testaceous brown in the majority of specimens to a few specimens with vertex black, thorax, scutellum, and ventral surface brownish black and elytra darker brown laterally and apically. However, when examined microscopically, none of the specimens have the thorax and scutellum entirely pitch black as in *varicolor*.

Included in the collection of the California Academy of Sciences were several specimens collected from 45 miles north of San Ignacio, Lower California. While they are similar in most respects to the specimens from Venancio and should be referred to *peninsularis*, they are not included in the type series of this species.

This species, while closely allied to *varicolor*, can be distinguished from it by its generally smaller size, brown or dark brown color, and the shape of the clypeus. It can be separated from the other species by the slightly concave appearance of the vertex behind the transverse carina when in lateral view, the eight-segmented antennae, and bidentate fore tibia.

*Podolasia saylori*, new species

HOLOTYPE: Male, length, 3.6 mm.; greatest width, 1.4 mm. Color of vertex of head brownish black, disc of thorax reddish brown, elytra light

brown, darker at the apices. Ventrally head and thorax reddish brown, abdomen brownish black. Clypeus moderately heavily punctured, similar in shape to that of *peninsularis*. Transverse carina on vertex of head between the eyes medially not so sharply delimited posteriorly as it is in *varicolor* or *peninsularis*. Medially vertex barely slopes downward behind carina and appears flat or slightly convex when in lateral view. Vertex smooth and shining.

In other characteristics *saylori* differs only slightly from *peninsularis* in the following respects: elytra are slightly less pilose, tarsal claws are slightly shorter, vestiture of ventral surfaces is shorter and less pronounced, and the triangular enlargements of the parameres of the male genitalia are more sharply delimited posteriorly and seem not so thick as is usual in *peninsularis*; the large flat surfaces are slightly concave in *saylori*, but this may be distortion caused by drying.

Female unknown.

TYPE MATERIAL: Holotype, male, San Domingo, Lower California, July 19, 1938, Michelbacher and Ross collectors (California Academy of Sciences). Paratype, male, with same data as type (the American Museum of Natural History).

The single paratype differs but slightly from the type. It is smaller, measuring 3.3 mm. in length by 1.2 mm. in width, darker brown ventrally, and the triangular tips of the genitalia are considerably more concave (distortion?) than they are in the type.

This species is named in honor of Dr. L. W. Saylor in recognition of his work in the group.

This species can be easily distinguished by its small size, bidentate fore tibia, and the slightly convex appearance of the vertex behind the transverse carina when in lateral view.

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